

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. A composite porous membrane comprising a hydrophobic substrate coated with difunctional surface-modifying molecules, each difunctional surface-modifying molecule comprising a hydrophobic portion associated with the substrate and a hydrophilic portion, wherein the surface-modifying molecules are crosslinked to form a crosslinked hydrophilic polymeric network at the surface of the membrane.
2. The membrane according to claim 1, wherein the hydrophilic portion of the surface-modifying molecules comprises at least two crosslinking active groups.
3. The membrane according to claim 2, wherein the crosslinking active group comprises a carbon-carbon double bond.
4. The membrane according to claim 1, wherein the difunctional surface-modifying molecules comprise difunctional acrylate molecules.
5. The membrane according to claim 1, wherein 100% of molecules associated with the substrate comprise difunctional surface-modifying molecules.
6. The membrane according to claim 1, wherein the hydrophobic ~~portion~~group is a hydrophobic alkyl, aromatic group, or olefinic hydrocarbon group.
7. The membrane according to claim 1, wherein the hydrophobic ~~portion~~group comprises an aromatic hydrocarbon molecule.
8. The membrane according to claim 7, wherein the aromatic hydrocarbon comprises a bisphenol A group.

9. The membrane according to claim 1, wherein the hydrophobic portiongroup does not form covalent bonds with the surface.
10. The membrane according to claim 1, wherein the hydrophilic portiongroup is positively charged.
11. The membrane according to claim 1, wherein the hydrophilic portiongroup is negatively charged.
12. The membrane according to claim 1, wherein the hydrophilic portiongroup comprises a neutral charge.
13. The membrane according to claim 1, wherein the hydrophilic portiongroup comprises the general formula $[-X_{n1}-Y-CR=CH_2]_{n2}$ where X is independently selected from the group consisting of $(-CH_2-CH_2-O-)$; $(-CH_2-O-)$; $(-CH_2-CH(COOH)-)$; $(-CH_2-CH(OH)-)$; Y is selected from the group consisting of $([-CH_2-]_{n3})$; $(-COO-)$; n_1 is from about 1-50; n_2 is from about 1-2; and n_3 can be from about 1 to about 50.
14. The membrane according to claim 1, wherein the difunctional surface modifying molecules are polymerized on the substrate surface after being preferentially adsorbed with the substrate surface.
15. The membrane according to claim 1, wherein the difunctional surface molecules comprise ethoxylated (30) bisphenol A diacrylates.
16. The membrane according to claim 1, wherein the difunctional-surface molecules are polymerized using a photoinitiator, and wherein the photoinitiator is preferentially adsorbed by the substrate surface.

17. The membrane according to claim 1, wherein the difunctional-surface molecules are polymerized using a photoinitiator that comprises a substantially hydrophobic molecule.

18. (Currently amended) The membrane according to claim 1, wherein the difunctional-surface molecules are polymerized using a photoinitiator-is selected from the group consisting of 1-hydroxy-cyclohexyl-phenyl-ketone; 2-benzyl-2-dimethylamino-1-(4-morpholinophenyl)-butanone-1; 50% 1-hydroxy-cyclohexyl-phenyl-ketone and 50% benzophenone; 25% bis(2,6-dimethoxybenzoyl)-2,4,4-trimethyl pentyphosphineoxide and 75% 2-hydroxy-2-methyl-1-phenyl-propan-1-one; 2,2-dimethoxy-1,2-diphenylethan-1-one; bis(2,4,6-trimethylbenzoyl)-phenylphosphineoxide; 80% 2-hydroxy-2-methyl-1-phenyl-propan-1-one and 20% 1-hydroxy-cyclohexyl-phenyl-ketone; 25% bis(2,6-dimethoxybenzoyl)-2,4,4-trimethyl-pentyphosphineoxide and 75% 1-hydroxy-cyclohexyl-phenyl-ketone; 2-hydroxy-2-methyl-1-phenyl-propan-1-one; benzophenone; 50% 2,4,6-trimethylbenzoyl-diphenyl-phosphineoxide and 50% 2-hydroxy-2-methyl-1-phenyl-propan-1-one; bis(ϵ 5-2,4-cyclopentadien-1-yl)-bis(2,6-dicluoro-3-(1H-pyrrol-1-yl)-phenyl)titanium; 2-methyl-1[4-(methylthio)phenyl]-2-morpholinopropan-1-one; 30% 2-benxyl-2-dimethylamino-1-(4-morpholinophenyl)-butanone-1 and 70% IRGACURE 651; and 1-[4-(2-hydroxyethoxy)-phenyl]-2-hydroxy-2-methyl-1-propane-1-one.

~~the photoinitiators shown in Figures 2A-2O.~~

19. The membrane according to claim 1, wherein the membrane has an average pore size of from about greater than 0 μm to about 10 μm .

20. The membrane according to claim 1, wherein the hydrophobic substrate comprises polyvinylidene fluoride.

21. The membrane according to claim 1, wherein the membrane is wettable within less than about 30 seconds after drying upon contacting with an aqueous solution.

22. The membrane according to claim 1, wherein the membrane is autoclavable.

23-47 (Canceled).